WHAT IS CLAIMED IS:

1. A system, comprising:

a first positioner configured to deflect a beam of laser energy about a pivot point;

a scan lens movable relative to the first positioner; and

an optical relay system configured to relay the pivot point to the scan lens in correspondence with movement of the scan lens.

2. The system of claim 1, wherein the first positioner is at least one selected from the group consisting of an AOD system and a galvanometer mirror system.

3. The system of ~~any of claims 1 or 2~~ claim 1, wherein the scan lens is movable relative to the optical relay system.

4. The system of ~~any of claims 1 to 3~~ claim 1, wherein the optical relay system is movable relative to at least one selected from the scan lens and the first positioner.

5. The system of ~~any of claims 1 to 4~~ claim 1, wherein the optical relay system includes:

an optical input;

a first reflector having a first reflective surface, wherein the first reflector is arranged to receive the beam of laser energy propagating from the first positioner;

an optical output; and

a second reflector having a second reflective surface opposing the first reflective surface, wherein the first and second reflective surfaces are arranged and configured to relay the beam of laser energy received at the first reflector from the optical input to the optical output.

6. The system of claim 5, wherein the optical relay system further includes:

a first lens arranged and configured to focus the beam of laser energy within the optical relay system; and

a second lens arranged and configured to focus the beam of laser energy exiting the optical relay system.

wherein the first lens and the second lens are configured to magnify the beam of laser energy.

7. The system of claim 6, wherein the first lens is configured to focus the beam of laser energy at a point that is separated from the first reflective surface and the second reflective surface.

8. The system of claim 5, further comprising a stage coupled to the optical relay system, wherein the stage is operative change a position of the optical relay system relative to at least one selected from the scan lens and the first positioner~~, or a combination thereof~~.

~~9. The system of any of claims 1 to 4, wherein the optical relay system includes:~~

~~a polarizing beamsplitter; and~~

~~a retarder arranged in optical communication with the polarizing beamsplitter.~~

9~~10~~. The system of ~~any of claims 1 to 8~~ claim 1, further comprising a second positioner arranged between the optical relay system and the scan lens.

10~~11~~. The system of claim 9~~10~~, wherein the second positioner is at least one selected from the group consisting of a galvanometer, an AOD system, a fast steering mirror, and a rotating polygon mirror.

11~~12~~. An optical relay system, comprising:

an optical input;

a first reflector having a first reflective surface wherein the first reflector is arranged to receive the beam of laser energy propagating from the first positioner;

an optical output; and

a second reflector having a second reflective surface opposing the first reflective surface, wherein the first and second reflective surfaces are arranged and configured to relay the beam of laser energy received at the first reflector from the optical input to the optical output.

12~~13~~. The optical relay system of claim 11~~12~~, wherein the first reflective surface and the second reflective surface are substantially parallel to one another.

13~~14~~. The optical relay system of claim 12~~13~~, wherein the first reflective surface and the second reflective surface are not parallel to one another.

14~~15~~. The optical relay system of any of claim 11~~12~~, wherein the optical relay system further includes:

a first lens mounted at the optical input; and

a second lens mounted at the optical output.

~~16. The system of claim 1, wherein the first positioner is movable relative to the optical relay system.~~

~~17. The system of claim 16, further comprising a stage coupled to the first positioner, the stage operative to change a position of the first positioner relative to the optical relay system.~~

~~18. The system of claim 17, wherein the stage is a linear motion stage.~~

~~19. The system of any of claim 16, wherein the first positioner is at least one selected from the group consisting of an AOD system and a galvanometer mirror system.~~

15~~20~~. An optical relay system, comprising:

a first lens;

a second lens;

a zoom lens assembly arranged between the first lens and the second lens, wherein the zoom lens assembly includes a first lens group and a second lens group, and wherein each of the first lens group and the second lens group includes a plurality of lenses.

16~~21~~. The optical relay system of claim 15~~20~~, wherein the zoom lens assembly is movable relative to at least one of the first lens and the second lens.

17~~22~~. The optical relay system of claim 16~~21~~, wherein the zoom lens assembly is mounted on a first positioner.

18~~23~~. The optical relay system of claim 17~~22~~, wherein the first positioner is a motion stage.

19~~24~~. The optical relay system of claim 15~~20~~ wherein at least one of the first lens and the second lens are selected from the group consisting of positive lenses, planar-convex lenses, bi-convex lenses, and positive meniscus lenses.

20~~25~~. The optical relay system of claim 15~~20~~, wherein the first lens group and the second lens group are telephoto doublets arranged symmetrically with respect to a transverse centerline of the zoom lens assembly.

21~~26~~. The optical relay system of claim 15~~20~~, wherein a distance between at least two lenses of the first lens group and a distance between at least two lenses of the second lens group is fixed.

22~~27~~. The optical relay system of claim 15~~20~~, wherein a distance between at least two lenses of the first lens group and a distance between at least two lenses of the second lens group is variable.

23~~28~~. The optical relay system of claim 22~~27~~ wherein the first lens group is mounted on a second positioner configured to adjust the distance between at least two lenses of the first lens group.

24~~29~~. The optical relay system of claim 23~~28~~, wherein the second positioner is a motion stage.

25~~30~~. The optical relay system of claim 22~~27~~ wherein the second lens group is mounted on a third positioner configured to adjust the distance between at least two lenses of the second lens group.

26~~31~~. The optical relay system of claim 25~~30~~, wherein the third positioner is a motion stage.